AMENDMENTS TO THE CLAIMS

1. **(Original)** A wellbore system for producing seismic energy in an earth formation, comprising:

(a) a cavity containing a fluid, said cavity disposed in a wellbore; and

(b) a drive source in fluid communication with said cavity for generating pressure waves in said cavity, said cavity producing seismic waves in the earth formation in response to said pressure waves, said cavity and said drive source forming a closed loop through which said fluid circulates.

2. **(Original)** The wellbore system of claim 1 wherein said drive source generates pressure waves at a selected resonance frequency of said cavity.

3. **(Original)** The wellbore system of claim 1 wherein said drive source includes at least one of (i) a rotary valve, (ii) an electro-solenoid oscillator, and (iii) a pump.

4. **(Original)** The wellbore system of claim 1 wherein said drive source for generating pressure waves is activated in a range of predetermined frequencies to create a swept frequency signal input.

5. **(Currently Amended)** The wellbore system of claim 4 wherein said swept frequency signal input is at least one of: i) an upsweep, ii) a downsweep, iii) a nonlinear sweep, a psuedo-random sweep and ~~iii)~~ iv) a random sweep.

6. **(Original)** The wellbore system of claim 1 further comprising seismic sensors to record said produced seismic waves.

7. **(Original)** The wellbore system of claim 1 wherein said fluid is at least one of: (i) a liquid, and (ii) a gas.

8. **(Original)** The wellbore system of claim 1 wherein said cavity is shaped to provide a broad frequency signal for said seismic waves in said earth formation.

9. **(Original)** The wellbore system of claim 1 wherein said fluid comprises a smart fluid.

10. **(Original)** The wellbore system of claim 9 further comprising at least one coil provided adjacent said cavity, said coil providing an excitation field for said smart fluid in said cavity when energized.

11. **(Original)** The wellbore system of claim 10 wherein an effective length of said smart fluid in said cavity can be controlled by selectively energizing said coil.

12. **(Original)** The wellbore system of claim 11 wherein said at least one coil includes a plurality of segments, each of which can be separately energized.

13. **(Original)** The wellbore system of claim 10 wherein said at least one coil is configured to provide an adjustable magnitude of intensity for said excitation field.

14. **(Original)** The wellbore system of claim 10 further comprising a control unit operably coupled with one of said drive source and said coil.

15. **(Original)** The wellbore system of claim 14 further comprising at least one sensor connected to said control unit, said at least one sensor configured to measure a selected parameter of interest.

16. **(Original)** The wellbore system of claim 15 wherein said selected parameter of interest is selected from a group consisting of (i) pressure, (ii) temperature, (iii) seismic energy, (iv) flow rate, and (v) frequency of pressure signals generated by said drive source.

17. **(Original)** The wellbore system of claim 15 wherein said control unit adjusts said drive source in response to a measurement provided by said at least on sensor.

18. **(Original)** The wellbore system of claim 1 further comprising a control unit operable coupled with one of said drive source.

19. **(Original)** The wellbore system of claim 18 further comprising at least one sensor connected to said control unit, said at least one sensor configured to measure a selected parameter of interest.

20. **(Original)** The wellbore system of claim 19 wherein said selected parameter of interest is selected for a group consisting of (i) pressure, (ii) temperature, (iii) seismic energy, (iv) flow rate, and (v) frequency of pressure signals produced by said drive source.

21. **(Original)** The wellbore system of claim 19 wherein said control unit adjusts said drive source in response to a measurement provided by said at least on sensor.

22. **(Original)** A method for producing seismic energy in an earth formation, comprising:

(a) providing a cavity in a wellbore, the cavity containing a fluid;

(b) injecting pressure pulses into the cavity with a drive source such that the cavity produces seismic waves in an adjacent earth formation; and

(c) circulating the fluid between the cavity and the drive source in a closed loop fashion.

23. **(Original)** The wellbore system of claim 22 wherein the fluid is injected in a manner that causes the cavity to resonate.

24. **(Original)** The method of claim 23 wherein the drive source includes at least one of (i) a rotary valve, (ii) an electro-solenoid oscillator, and (iii) a pump.

25. **(Original)** The method of claim 22 wherein the fluid comprises a smart fluid.

26. **(Original)** The method of claim 25 further comprising providing an excitation field for the smart fluid in the cavity using at least one coil.

27. **(Original)** The method of claim 26 further comprising controlling an effective length of the smart fluid in the cavity by selectively energizing the at least one coil.

28. **(Original)** The method of claim 26 wherein the at least one coil includes a plurality of segments, each of which can be separately energized.

29. **(Original)** The method of claim 25 further comprising controlling the injection of the fluid with a control unit.

30. **(Original)** The method of claim 29 wherein the injection is controlled in response to a measured parameter of interest.

31. **(Original)** The method of claim 30 wherein the measured parameter of interest is selected from a group consisting of (i) pressure, (ii) temperature, (iii) seismic energy, (iv) flow rate, and (v) frequency of pressure signals produced by the drive source.

32. **(Original)** The method of claim 22 further comprising a controlling the injection of the fluid with a control unit.